UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,896	08/31/2001	Rudolf M. Bolle	YOR9-2000-0609 US2	2094

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EXAMINER
COUSO, YON JUNG

ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 06/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>06 April 2005</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-37</u> is/are pending in the application.

    4a) Of the above claim(s) <u>25-37</u> is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-24</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>08 January 2002</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

1.   Applicant's election of Group I of claims 1-24 in the reply filed on April 6, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2.   Claims 9, 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

    Claim 9 is not clear how the characteristics of the sub region images would include sex, geographical location, weather, income, profession, and genetics.

    Claim 11, lines 2-4, example (e.g.) does not clearly define the boundary of the claim. Please make an appropriate correction.

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

    This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)

prior art under 35 U.S.C. 103(a).

Claims 1-9, 11, 12, 13, and 16-24 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Montillo et al (US Patent No. 6,647,132) in view of Clarke et al (US

Patent No. 5,825,936).

With regard to claim 1, Montillo teaches an image enhancement process

comprising the steps of: a windowing process that selects a sub region of an image

(column 5, lines 13-15); determining a value for each of one or more characteristics of

the sub region, the characteristics being of a subject of the sub region (column 6, lines

33-40); defining one or more classes of the sub region from the values (column 2, lines

29-31 and column 8, lines 16-47); and filtering sub region to remove unwanted features

(column 8, lines 48-51). Montillo does not teach details on selecting one or more

transform filters obtained using the learning/training process, that corresponds to each

class; and successively applying the transform filter to the sub region having the same

class as the transform filter to obtain a transformed sub region. However, Montillo

discloses that many different filters can be used without departing from the scope of the

invention (column 8, lines 51-54). Clarke teaches one of the many different filters known

and used in the art (abstract, lines 1-4 and figure 2). Clark discloses selecting one or

more transform filters obtained using the learning/training process, that corresponds to

each class (column 6, lines 20-59); and successively applying the transform filter to the

sub region having the same class as the transform filter to obtain a transformed sub

region (column 6, line 53-column 14, line 26). It would have been obvious to one of

ordinary skill in the art, given the references at the time the invention was made, to

incorporate Clarke's filter into Montillo's System of identifying regions of similar

characteristics in the image. The motivation to do so is stated in the Montillo's

disclosure. Montillo stated in several sections in the disclosure that the filtering could be

replaced by any other known filters to remove the unwanted feature in the sub region (at

least in column 8, lines 48-54 and column 10, lines 42-45).

With regard to claim 2, Montillo teaches two or more transformed sub regions are

combined to produce an enhanced sub region (column 12, lines 32-39).

With regard to claim 3, where the transformed sub regions are combined using a

weighted summation of the transformed sub regions.

With regard to claim 4, Montillo teaches where one or more of the sub regions

are determined by any one or more of the following: a pixel-wise amplitude of the sub

region, an average amplitude of the sub region, an image frequency of the subregion,

an orientation of the sub region, an amplitude transition in the orientation direction, a

local contrast, a local phase, a scalar quantization of intensity values of the sub region,

a vector quantization of intensity values of the sub region, a dryness measure of the sub

region, a smudge measure of the sub region, a quality of the sub region, an average

amplitude of the entire image, an average frequency of the entire image, an average

quality of the entire image, and an average orientation variation of the entire image

(column 6, lines 33-40).

With regard to claim 5, Montillo teaches a number of the sub regions is

determined by any one or more of the following: a pixel-wise amplitude of the sub

region, an average amplitude of the sub region, an image frequency of the subregion,

an orientation of the sub region, an amplitude transition in the orientation direction, a

local contrast, a local phase, a scalar quantization of intensity values of the sub region,

a vector quantization of intensity values of the sub region, a dryness measure of the sub

region, a smudge measure of the sub region, a quality of the sub region, an average

amplitude of the entire image, an average frequency of the entire image, an average

quality of the entire image, and an average orientation variation of the entire image

(column 6, lines 33-40 and figure 7).

With regard to claim 6, Montillo teaches where a shape of the sub regions are

determined by any one or more of the following: a pixel-wise amplitude of the sub

region, an average amplitude of the sub region, an image frequency of the subregion,

an orientation of the sub region, an amplitude transition in the orientation direction, a

local contrast, a local phase, a scalar quantization of intensity values of the sub region,

a vector quantization of intensity values of the sub region, a dryness measure of the sub

region, a smudge measure of the sub region, a quality of the sub region, an average

amplitude of the entire image, an average frequency of the entire image, an average

quality of the entire image, and an average orientation variation of the entire image

(column 5, lines 39-52).

With regard to claim 7, Montillo teaches that an extent of overlap one or more of

the sub regions is determined by any one or more of the following: a pixel-wise

amplitude of the sub region, an average amplitude of the sub region, an image

frequency of the subregion, an orientation of the sub region, an amplitude transition in

the orientation direction, a local contrast, a local phase, a scalar quantization of intensity

values of the sub region, a vector quantization of intensity values of the sub region, a

dryness measure of the sub region, a smudge measure of the sub region, a quality of

the sub region, an average amplitude of the entire image, an average frequency of the

entire image, an average quality of the entire image, and an average orientation

variation of the entire image (column 12, lines 32-39).

      With regard to claim 8, Montillo teaches that the characteristics are image

characteristics that include any one or more of the following: a pixel-wise amplitude of

the sub region, an average amplitude of the sub region, an image frequency of the

subregion, an orientation of the sub region, an amplitude transition in the orientation

direction, a local contrast, a local phase, a scalar quantization of intensity values of the

sub region, a vector quantization of intensity values of the sub region, a dryness

measure of the sub region, a smudge measure of the sub region, a quality of the sub

region, an average amplitude of the entire image, an average frequency of the entire

image, an average quality of the entire image, and an average orientation variation of

the entire image (column 6, lines 33-40).

      With regard to claims 13, 16-21, it would have been obvious to one of ordinary

skills in the art to incorporate characteristics that are inherent in the image, such as

amplitude, frequency, quality, texture, amplitude transition, perpendicular amplitude

transition, and/or orientation. These are the characteristics that are inherent to the

image, that mere incorporation of these characteristics to represent the sub region when

Montillo already uses different characteristics to represent the image would have been obvious to one of ordinary skills in the art.

With regard to claim 11, Clarke teaches that the transform filter is chosen from a class that is near to the selected class (column 6, lines 20-59).

With regard to claim 12, it would have been obvious to one of ordinary skill in the art to select a filter that would benefit the most for the image under consideration. It would mean to find a filter that is near to the selected class by calculating the distance.

With regard to claim 22, Clarke teaches where one or more of the transformed filter is applied more than once to obtain the transformed sub region (column 7, lines 21-22).

With regard to claim 23, it would have been obvious to one of ordinary skill in the art to set a threshold to limit the number of times the transform filter is applied because even though Clarke discloses that the filtering is repeated for feature preservation, it can not go on indefinitely. There has to a predetermined number set for the filtering operation.

With regard to claim 24, Clark teaches that the transform filter is applied until condition is met (column 7, lines 2-8).

4.   Claims 10, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montillo in view of Clark as applied to claim 1 above, and further in view of Chang et al (US Patent No. 5,572,597).

With regard to claim 10, Montillo in view of Clark does not teach details on the image being a fingerprint image. However, many techniques taught in the image

processing are applicable to different types of image. Chang teaches classifying

fingerprint images into different types based on the sub region image characteristics,

similar to Montillo (abstract, lines 6-8). Montillo teaches determining a value for each of

one or more characteristics of the sub region, the characteristics being of a subject of

the sub region (column 6, lines 33-40); defining one or more classes of the sub region

from the values (column 2, lines 29-31 and column 8, lines 16-47). Given these

references at the time the invention was made, it would have been obvious to one of

ordinary skill in the art to incorporate fingerprint image into Montillo's system that

performs similar processing as in Chang. Motivation to do so would be they are both

classifying images into different types based on the sub region image characteristics

and that many techniques taught in the image processing are applicable to different

types of image.

With regard to claim 14, Chang teaches the characteristic is the ridge orientation

in a neighboring subregion and the value is orientation of the ridge with respect to x-axis

in t-multiples of degrees (figure 3 and column 5, line 46-column 6, line 14).

With regard to claim 15, Chang teaches at least where t=90 (60a and 60e in

figure 3).

5.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

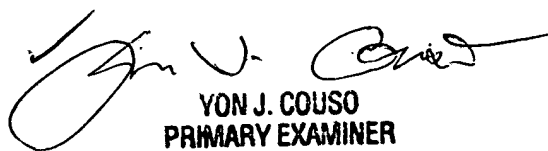Kuperstein, Horiba et al, and Hoffberg et al are also cited.

6.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Yon Couso whose telephone number is (571) 272-7448.

The examiner can normally be reached on Monday through Friday from 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Bhavesh Mehta, can be reached on (571) 272-7453. The fax phone number

for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

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published applications may be obtained from either Private PAIR or Public PAIR.

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

YJC

YON J. COUSO
PRIMARY EXAMINER

June 6, 2005